On the Early Stages of Brachiopods.—The writer made a visit to Eastport, Maine, early in the summer, for the purpose of discovering the early stages of a species of Brachiopod (*Terebratulina septentrionalis* Couth.) so abundant in those waters. As little has been known regarding the early stages of this class of animals the facts here presented will be of interest, as settling beyond a doubt their intimate relations with the Polyzoa. As the subject will be fully presented at the meeting of the American Association, only the more important features will be mentioned here. In a few individuals the ovaries were found partially filled with eggs. The eggs (Fig. 65) were kidney shaped, and resembled the statoblasts of Fredericella. No intermediate stages were seen between the eggs and the form represented in Fig. 66. This stage recalled in general proportions Megerlia or Argiope in being transversely oval, in having the hinge-margin wide and straight and in the large foramen.

Fig. 65. Fig. 66. Fig. 67. Fig. 68. Fig. 69. Fig. 70. Fig. 71.

Between this stage and the next the shell elongates until we have a form remarkably like Lingula (Fig. 67), having, like Lingula, a peduncle longer than the shell, by which it holds fast to the rock. It suggests also in its movements the nervously acting Pedicellina.

In this and the several succeeding stages, the mouth points directly backward (forward of authors), or, away from the peduncular end (Fig. 68), and is surrounded by a few ciliated cirri, which forcibly recall certain Polyzoa. The stomach and intestine form a simple chamber, alternating in their contractions and forcing the particles of food from one portion to the other. At this time also the brownish appearance of the walls of the stomach resembles the hepatic folds of the Polyzoa. Fig. 69 shows a more advanced stage, where a fold is seen on each side of the stomach; from this fold the complicated liver of the adult is developed, first, by a few diverticular appendages, as seen in Fig. 70.

When the animal is about one-eighth of an inch in length the lophophore begins to assume the horseshoe shaped form of Pectinatella and other high Polyzoa. The mouth at this stage (Fig. 70) begins to turn towards the dorsal valve (ventral of authors), and as the central lobes of the lophophore begin to develop, the lateral arms are deflected as in Fig. 71. In these stages an epistome is very marked, and it was noticed that the end of the intestine was held to the mantle by attachment, as in the adult, reminding one of the *funiculus* in the *Phylactolæmata*. No traces of an anus were discovered, though many specimens were carefully exam-

ined under high powers for this purpose, the intestine of the adult being repeatedly ruptured under the compressor without showing any evidence of an anal aperture.—EDWARD S. MORSE.

SARCOPSYLLA (PULEX) PENETRANS.—Having had some personal acquaintance with the doings of this insect, allow me to make a few observations suggested by the account of it in the "Guide to the Study of Insects," p. 390. "The best preventatives (Webster gives *preventives*) against its attacks are cleanliness, and the constant wearing of shoes or slippers when in the house, and of boots when out of doors."

As I was not in the habit of going entirely barefooted, I cannot say whether I would have been more troubled by the nigua (Spanish)—or jigger (Florida), or chigoe or chique (French); *bicho* is applied to almost any sort of bug—than with shoes, or with shoes and stockings; and as I never wore boots I am not sure how much protection they would have afforded in either case. I imagined too that I was not unmindful of cleanliness—in general. By this it is not to be understood that I was not at times hardly presentable. I may even confess that I was sometimes dirty—yea, *very* dirty. I went into the woods among the bushes and tall grasses often dripping with water. Sometimes I slid or rolled down the hills, or slipped up in the muddy roads. I had to climb trees,—yes, shin up them, and when wet too,—or miss the flowers in their very tops. I waded in ponds of very dirty water and in creeks clear as crystal, till my feet were soaked, even parboiled; yet the niguas *would* bore into them. More than once too they have penetrated my fingers, and I will not suffer the imputation that these were habitually unclean, which would be the inference from the confession that jiggers entered them, if it were a fact that uncleanliness is favorable to their entrance. But the truth is that their *entrance* is due to their own instinct alone—their *continuance* there to neglect. It may be that they *take* more to some persons than to others, as vermin generally are said to do; though this, again, is attributed to uncleanliness in the parties so affected. At all events it seems certain that some persons are less sensitive to these pests, or that they are less or not at all attacked by them. Some persons *say* that fleas do not get upon them. They may be of the hard-skinned sort.

The male "nigua" looks like a small flea, but does not jump, only runs. These may be often seen in places much frequented by swine particularly, and in the mills for hulling coffee, much like old-fashioned cider mills, the area of which is dry and trodden to dust by the oxen which draw the wheel. I have seen them also where a pet deer was accustomed to lie.

The female is rarely seen till felt. It is she alone that penetrates the skin. The male causes no annoyance. After traversing woods frequented by swine I have often had to extract some of the females on the following day, if I discovered their presence, which was not always the case. She enters the skin, vertically, just her own length. The tip